WISCONSIN DEPARTMENT OF TRANSPORTATION

BUREAU OF AERONAUTICS

AIRPORT LAYOUT PLAN

DEVELOPMENT

GUIDE/CHECKLIST

January, 2003

INTRODUCTION

This manual was developed by the Wisconsin Department of Transportation, Bureau of Aeronautics, to be used as a guide and checklist for the development and preparation of airport layout plans, and to assist the preparer in conforming with FAA Advisory Circular (AC) 150/5300-13, and changes. According to the AC, the components of an Airport Layout Plan (ALP) are as follows:

1. Narrative Report (Airport Layout Plan Report)
2. Airport Layout Drawing
3. Terminal Area Drawing
4. Inner Portion of the Approach Surface Drawing (Approach Sheets)
5. Airport Property Map
6. Land Use Drawing
7. Airport Airspace Drawing - FAR Part 77 Surfaces

I. Transmittal Letter

ALPs should be sent to FAA for airspace review using a standardized letter under the section chief's signature. See pages 20 & 21 for a sample transmittal letter. The letter should contain the following:

A. Reference to its Airspace Case number, which is assigned by FAA by upon entry into the OE/AAA database. (Presently, only AME Section has access)

B. A statement as to whether the submittal is a first time ALP or an update of a previous ALP. If an update, state what the update replaces, e.g., "it replaces an approved ALP dated_____."

C. A page by page description of the changes made to the previous ALP. (An extra copy of the ALP with the changes highlighted may be submitted to aid FAA in their review, but it is not required.)

D. Any request for waivers or "determinations of no hazard" should be stated in the description of the page on which the items in question are shown. State the reason for the request.

E. The end of the letter should summarize the requested waivers and "determinations of no hazard". If there are none, it should be so stated.

F. There should be a statement that, " There are no obstructions to the Appendix 2 surfaces, or to the obstacle free zones." , if such is the case.

G. The transmittal letter should be sent to the appropriate FAA Regional Offices as listed on the distribution list. The list is subject to change from time to time and can be found at w:\business\lists\FAAaddresses airspace coord.

II. Narrative Report

A. **Definition** - A condensed report explaining the reasoning behind, and the important features of the ALP. The report should accompany any new or significantly changed ALP for agency and sponsor review. When ALP preparation is being accomplished in conjunction with a Master Plan Study, the Master Plan Report will contain this information, and an ALP narrative report is not necessary. When periodically updating ALP's, a narrative report is not required unless major changes in airport function, classification or facilities are anticipated.

B. **Components**

1. **Inventory** - Includes data on existing airport facilities, aviation activity (total operations, itinerant operations, instrument operations), based aircraft and critical aircraft. This element may also include the results of a need study or user survey where the planned improvements require documentation of need.

2. **Forecasts** - Includes as a minimum, short (0-5 years), intermediate (6-10 years) and long range (11-20 years) forecasts for the following:

   a) total annual operations

   b) annual itinerant operations

   c) based aircraft

   d) annual instrument approaches

   e) Existing and future annual operations by the critical design aircraft. For the critical design aircraft, identify the type of aircraft, (i.e.: design group, approach speed, and gross loading characteristics)

3. **Demand/Capacity Analysis** - Includes a comparison of existing airport facilities and forecast needs to determine facility requirements, such as:

   a) length, strength and number of runways

   b) apron and tiedown requirements

   c) area requirements for terminal buildings, hangars, and auto parking

   d) navaids and other airport aids

   e) taxiways

4. **Site Selection** - If a new airport or new runway is being considered, include a discussion of the factors which influenced its location, such as: airspace, environmental considerations, community needs, airport access, land availability, total costs, and engineering factors which may affect site development.

5. **Stage Development** - Indicate staging of improvements shown on the ALP, based on short, intermediate and long range (5, 10 and 20 years) forecasts of aviation activity.

6. **Economic Feasibility** - Show comparisons of annual costs needed to implement the phased development with annual revenues available or forecast to be available. Cost estimates for each stage of the proposed development should be included.

7. **Wind Data** - Discuss the wind data and coverage. Identify the source, period covered, and the number of observations. If applicable, determine the best alignment for the primary and/or the crosswind runway for optimum wind coverage.

8. **Alternative Analysis** - Briefly discuss and analyze the obvious alternatives. Explain why the selected alternative was chosen.

9. **Approaches** - Discuss the existing and future approaches. Determine if there are or will be any obstructions to FAR Part 77, Appendix 2, or TERPs surfaces. If there are obstructions, discuss their penetration and their proposed disposition. Identify any existing determinations of no hazard and the date granted. Determine if any additional determinations of no hazards are necessary. Describe the object and why a determination of no hazard is necessary.

10. **Waivers & Modifications to FAA Design Standards** - Identify any existing waiver and the date granted. Determine if any additional waivers are necessary. Identify the violations to all FAA standards including: approach surfaces, runway and taxiway separation distances, runway and taxiway object free areas, runway and taxiway safety areas, building restriction lines, runway obstacle free zone, controlled activity area, and the instrument landing system critical areas. Describe what is being waived and why a waiver is necessary, or the proposed disposition of each violation.

11. **Compatible Land Use** - Describe any local and/or regional planning efforts and zoning ordinances in effect or anticipated which would have an effect on or be affected by the airport development.

III. Airport Layout Plan

General Guidelines

- Recommended plan size is either 22″x34″ or 24″ x 36″ when plotted, depending on the size of the airport.
- Minimum Desirable Letter Size: based on scale to be plotted.

Example Scale of Drawing 1″ = 100′	Minimum Text = 15 feet
1″ = 200′	Text = 25 feet
1″ = 300′	Text = 35 feet
1″ = 400′	Text = 50 feet
1″ = 1000′	Text = 125 feet

- Because of the number of imaginary surfaces required by FAA to be depicted on ALP's, it is necessary to separate ALP's into sections corresponding to Existing, Future (where appropriate), and Ultimate. This separation should apply to Layout Sheets and Approach Sheets. This means there will be a minimum of 2 Layout Sheets and 4 Approach Sheets for even the simplest ALP.
- Each sheet should have a numerical and graphic scale. If the plans are reduced after plotting, numerical scale should be blocked out.
- All ALP elevations should be established using North American Vertical Datum 1988 (NAVD88), which is the official datum for mean sea level in the United States.
- All sheets will have a legend that explains all pertinent features that are not identified. Existing features should be shown with solid lines, and future and ultimate items shown with dashed lines.
- Identify runways by numerical designation in all references to a specific runway.
- Show True North to the top of each sheet or to the left as an alternative. When CADD reference files are used to create Plan & Profile sheets the north arrow will vary on these sheets and should be prominently displayed. Indicate both True North and Magnetic North and the year of the magnetic declination used.
- Each sheet should have a Title and Revision Block - see page 8 for example.

A. **Title Sheet** - See page 9 for a sample title sheet. Include the following features on the title sheet.

1. Outline of pavements, existing and ultimate, should appear in the middle of the sheet at an appropriate scale (usually 1″ = 800′ or 1″ = 1,000′.)

2. Title and revision blocks, see page 8.

3. Consultant signature block.

4. Index to sheets, see page 8.

5. Wind Rose; all weather and IFR, where appropriate, with a minimum depiction of 10.5 knots 13 knots, 16 knots and 20 knots delineated on the rose, as appropriate. Cite the data source and time period covered. See AC 150/5300-13, Appendix 1 for guidance in the development of wind rose data. If IFR wind rose is depicted, state % of time IFR conditions exist.

6. Approval Blocks - Airport owner, BOA and FAA - See page 8.

7. State outline with county boundaries shown. County in which airport is located should be blackened.

8. Location Map - location of the airport shown on a state highway base map.

9. Vicinity Map - location of the airport shown on a county map.

10. Airport Data Table - see page 10 for sample. Should contain the following:

    a) Airport Classification (BU-A, BU-B, GU, T/C, AC/C). These represent Basic Utility A & B, General Utility, Transport/Corporate, and Air Carrier/Cargo, respectively.

    b) Airport Reference Point - Lat/Long of center of ultimate development, to the nearest hundredth of a second.

    c) Airport elevation - the highest point of the runways, to the nearest tenth of foot.

    d) Mean maximum temperature of the hottest month.

    e) Airport and Terminal Navigational Aids - (VOR, NDB, ILS, GPS, etc.)

    f) Visual Aids - (VASI, PAPI, REIL, MALS, etc.)

    g) Miscellaneous Facilities - (Rotating Beacon, segmented circle, taxiway lighting, etc.)

11. Design Critical Aircraft Data Table - see page10 for sample. Identify the critical aircraft design groups and approach categories which regularly use each runway for existing data and which are anticipated for ultimate development.

    a) Runway number.

    b) Aircraft Weight - Maximum gross take-off weight of critical aircraft - **NOT PAVEMENT STRENGTH.**

c) Approach Speed - Maximum approach speed for category of the critical aircraft using the airport (Approach Category A < 91 knots, B < 121 knots, etc.)

d) Wing Span - Maximum wing span for the design group of the critical aircraft using the airport (Design Group I < 49′, II < 79′, etc.)

e) Tail height - Tail Height of critical aircraft.

f) Airport Reference code (ARC) - Approach Category and Design Group.

Note: The data need not be all from the same specific aircraft. Approach speed can be for a Lear Jet, wingspan for a Citation, etc.

B. **Airport Layout Drawing (Scale: 1″ = 300′ to 1″ = 800′)**

1. All man-made and natural objects on the airport and in the approach areas must be shown. Airport facilities shown (existing, future, or ultimate, on their respective sheets) include runways, taxiways, aprons, blast pads, stabilized overruns and shoulders, runway safety areas, runway object free areas, buildings, navaids, parking areas, roads, lighting, runway numbers, fences, segmented circle and lighted wind tee or cone, fueling facilities, beacon (elev. noted), tie downs, facilities associated with navaids, and control tower (elevation noted.)

2. Prominent topographic features shown on and adjacent to the airport include trees, streams, ponds, rock outcropping, ditches, railroads, roads, power lines, towers, buildings, and contours when significant.

3. Runway Data Table: (Existing and Ultimate, unless there is a significant intermediate step) see page 10 for sample. This table should appear on all Airport Layout Sheets, with all the data included.

a) Runway Dimensions: length and width of runways.

b) Effective Gradient: expressed as a %: difference in end elevations divided by the total runway length.

c) Percent Wind Coverage: 10.5 and 13 knots minimum, 16 and 20 knots as appropriate.

d) Runway Visibility Minimums: visual, 1 mile, ¾ mile, ½ mile, CAT II, CAT III.

e) Pavement Strength: gross weight - single, dual, dual tandem gear.

f) Approach Slope (design): for each runway end.

g) Approach Slope (actual): for each runway end (should match "clear for" data.)

h) Runway lighting: LIRL, MIRL, HIRL.

i) Runway marking: basic, non-precision instrument, precision instrument.

j) Runway pavement type: turf, bituminous, PCC, other.

k) Visual & navigational aids: VASI, PAPI, REIL, MALSR, etc.

4. Existing or Ultimate Approach surfaces w/dimensions*.

5. Existing or Ultimate runway object free areas w/dimensions*.

6. Existing or Ultimate runway safety areas w/dimensions*.

7. Existing or Ultimate runway end coordinates (Lat., Long.)*, to the nearest hundredth of a second.

* Show dimensions for these features in tables and on drawing when dimensioning each feature would not clutter the drawing. Where these design features cannot be provided because of topographical or other constraints, a notation should be made. See page 12 for an example of tables. Where several substandard conditions exists, a table of modifications to Federal Standards should be included on the Layout Drawing. The table should include the substandard item, why it is substandard and FAA's action. See example, page 12.

8. Design approach slopes.

9. Section lines and corners, township and range, bench marks and monuments on the airport are shown. Existing property boundary line and easements are prominently shown and checked with latest Exhibit "A", certified survey maps, or deeds. The legend should identify the symbol for fee, clear zone easement, and avigation easement. Ultimate property interest line is also shown. Add the following note:

"When property interest is purchased, consideration will include the following:

(1) Limits of land eligible for FAA participation;
(2) Desires of property owner;
(3) Existing property ownership boundaries;
(4) Protection of the imaginary surfaces described in FAR Part 77.25;
(5) Existing land use zoning controls.

Property interest may be acquired by fee or air easement rights."

WISCONSIN DEPARTMENT OF TRANSPORTATION
BUREAU OF AERONAUTICS

TITLE & APPROVAL SHEET

SCHMAUS COUNTY AIRPORT
SCHMAUSVILLE, WISCONSIN

SCHMAUS & ASSOCIATES, INC.
AIRPORT CITY, WISCONSIN

SCALE:	DATE:	DWN BY:	SHEET OF

WISCONSIN DEPARTMENT OF TRANSPORTATION
BUREAU OF AERONAUTICS

REVIEWED BY: _____ P. E.
AIRPORT DEVELOPMENT ENGINEER

DATE: _____

FEDERAL AVIATION ADMINISTRATION

THE WISCONSIN DEPARTMENT OF TRANSPORTATION, BUREAU OF AERONAUTICS - BOA APPROVES THE AIRPORT LAYOUT PLAN IN ACCORDANCE WITH THE FEDERAL AVIATION ADMINISTRATION BLOCK GRANT AGREEMENT AND SUBJECT TO AIRSPACE CASE _____

APPROVED: _____ DATE: _____
DAVID M. GREENE, BOA DIRECTOR

CITY OR COUNTY OF

_____

APPROVED BY: _____

TITLE: _____

DATE: _____

INDEX TO SHEETS

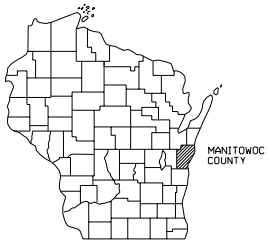
SHEET 1 REVISIONS

DESCRIPTION OF REVISIONS	DATE:	FIRM OR AGENCY NAME	DWN BY:

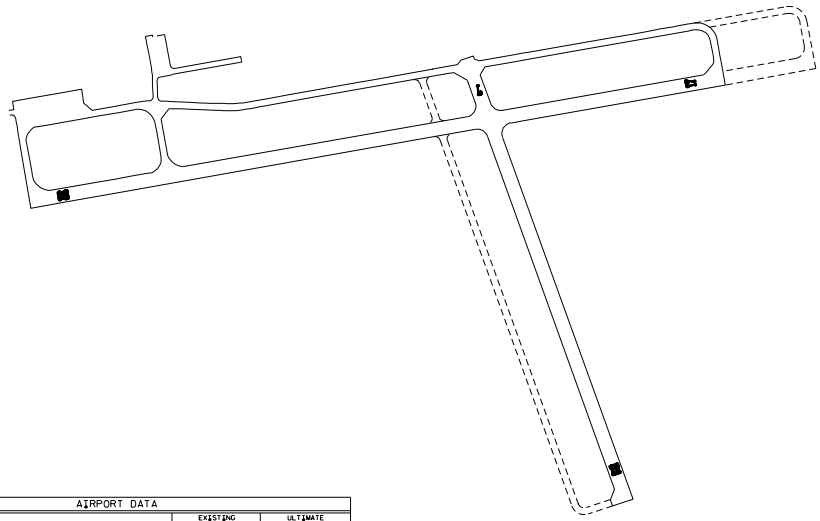
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
BUREAU OF AERONAUTICS

AIRPORT LAYOUT PLAN

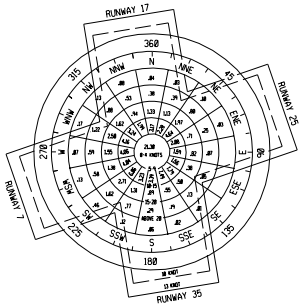
MANITOWOC COUNTY AIRPORT
MANITOWOC, WISCONSIN



NORTH

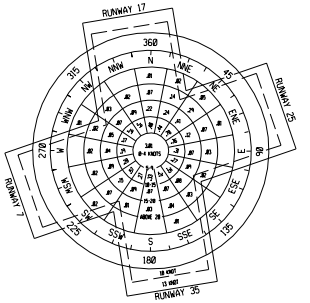


INDEX TO SHEETS		
SHEET	TITLE	REVISION DATE
1	TITLE & APPROVAL	
2	AIRPORT LAYOUT DRAWING	
3	TERMINAL AREA DRAWING	
4	RUNWAY 17 APPROACH PLAN	
5	RUNWAY 35 APPROACH PLAN	
6	RUNWAY 7 APPROACH PLAN	
7	RUNWAY 25 APPROACH PLAN	
8	LAND INVENTORY MAP	
9	AIRPORT LAND USE DRAWING	



WIND COVERAGE	10 KNOTS	13 KNOTS
RUNWAYS 17/35	85.21%	94.93%
RUNWAYS 17/35 & 7/25	96.15%	

ALL WEATHER WIND ROSE *



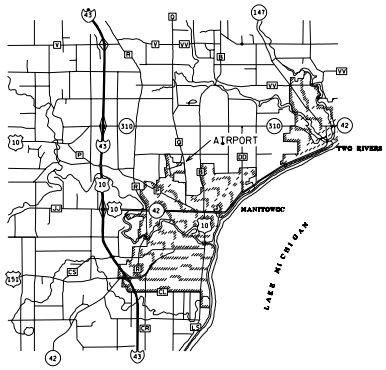
	% OF ALL WEATHER	% OF IFR COVERAGE
WIND COVERAGE	13 KNOTS	13 KNOTS
CALM 0-4 KNOTS	3.01%	26.6%
RUNWAY 35	4.41%	39.0%
RUNWAY 17	3.41%	30.2%
UNCOVERED	0.48%	4.2%
TOTAL	11.31%	100.0%

IFR WIND ROSE *

* SOURCE: NATIONAL WEATHER BUREAU RECORDS
FOR GREEN BAY, WISCONSIN 1960 - 1964

LOCATION MAP

SOURCE: CHICAGO & GREEN BAY SECTIONAL AERONAUTICAL CHARTS



VICINITY MAP

SCALE 0 1 2 MILES

AIRPORT DATA		
	EXISTING	ULTIMATE
AIRPORT CLASSIFICATION	GU-I	GU-II
AIRPORT REFERENCE POINT COORDINATES	LAT. 44°50'49"N LONG. 91°29'29"W	
AIRPORT ELEVATION	817.9	819.2
MEAN MAXIMUM TEMPERATURE OF HOTTEST MONTH	86.1 JULY	86.1 JULY
AIRPORT & TERMINAL NAVIGATION AIDS	VOR, NDB	VOR, NDB, ILS
VISUAL AIDS	VASI	VASI
MISCELLANEOUS FACILITIES: TAXIWAY LIGHTING, LIGHTED WIND CONE, SEGMENTED CIRCLE, CEILOMETER, ROTATING BEACON		

DESIGN CRITICAL AIRCRAFT DATA				
	EXISTING		ULTIMATE	
RUNWAY	4-22	13-31	4-22	13-31
AIRCRAFT WEIGHT	≤ 12,500 LBS.	12,500 - 60,000 LBS.	≤ 12,500 LBS.	60,000 LBS.
APPROACH SPEED	< 120 KNOTS	< 141 KT	< 121 KT.	< 141 KT.
WING SPAN	< 48 FT.	< 79 FT.	< 48 FT.	< 118 FT.
TAIL HEIGHT	17 FT.	21 FT.	17 FT.	32 FT.
AIRPORT REFERENCE CODE	B-I	C-II	B-I	C-III

SHEET 1 REVISIONS			
DESCRIPTION	DATE	FIRM OR AGENCY	BY

FEDERAL AVIATION ADMINISTRATION

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APPROVED: _____ DATE: _____
DAVID W. GREENE, BOA DIRECTOR

WISCONSIN DEPARTMENT OF TRANSPORTATION
BUREAU OF AERONAUTICS

REVIEWED BY: _____ P.E.
AIRPORT DEVELOPMENT ENGINEER

DATE _____

MANITOWOC COUNTY

APPROVED _____

TITLE _____

DATE _____

WISCONSIN DEPARTMENT OF TRANSPORTATION
BUREAU OF AERONAUTICS

TITLE & APPROVAL SHEET

MANITOWOC COUNTY AIRPORT
MANITOWOC, WISCONSIN

PREPARED BY: SCHMAUS & ASSOCIATES, INC.
AIRPORT CITY, WISCONSIN

SCALE:	DATE:	DWN BY:	SHEET OF

RUNWAY DATA

	RUNWAY 13/31				RUNWAY 4/22			
	EXISTING		ULTIMATE		EXISTING		ULTIMATE	
RUNWAY DIMENSIONS	60' X 2500'		75' X 4000'		75' X 5400'		100' X 6000'	
EFFECTIVE GRADIENT (IN %)	.16		.38		.07		.31	
% WIND COVERAGE 10.5 KNOTS / 13 KNOTS	87.5 / 84.2		SAME		89.9 / 86.6		SAME	
RUNWAY VISIBILITY MINIMUMS	V		1 MILE		¾ MILE		½ MILE	
PAVEMENT STRENGTH *	10 S, 30 D		30 S, 50 D		60 S, 80 D, 140 DT		SAME	
APPROACH SLOPE (DESIGN)	20:1		13: 34:1	31: 20:1	34:1		4: 50:1	22: 34:1
APPROACH SLOPE (ACTUAL)	13: 15:1	31: 23:1	13	31	4: 40:1	22: 35:1		
RUNWAY LIGHTING	LIRL		MIRL		MIRL		HIRL	
RUNWAY MARKING	VISUAL		NON-PREC. INST.		NON-PREC. INST.		PREC. INST.	
RUNWAY PAVEMENT TYPE	BITUM.		SAME		BITUM.		SAME	
VISUAL & NAVIGATION AIDS			VASI, REIL		VASI		ILS,ALS,RVR	

* VALUES GIVEN ARE GROSS AIRCRAFT WEIGHT IN 1000# SINGLE (S), DUAL (D) & DUAL TANDEM (DT) GEAR AIRCRAFT.

U-UTILITY T-TRANSPORT P-PRECISION V-VISUAL NP-NON PRECISION

AIRPORT DATA

	EXISTING	ULTIMATE
AIRPORT CLASSIFICATION	GU-I	T/C
AIRPORT REFERENCE POINT COORDINATES	LAT. 44°50'49"N LONG. 91°29'29"W	
AIRPORT ELEVATION (MSL)	817.9	819.2
MEAN MAXIMUM TEMPERATURE OF HOTTEST MONTH	86.1 JULY	86.1 JULY
AIRPORT & TERMINAL NAVIGATION AIDS	VOR, NDB	VOR, NDB, ILS
VISUAL AIDS	VASI	VASI

MISCELLANEOUS FACILITIES:
TAXIWAY LIGHTING, LIGHTED WIND CONE, SEGMENTED CIRCLE, CEILOMETER, ROTATING BEACON

DESIGN CRITICAL AIRCRAFT DATA

	EXISTING		ULTIMATE	
RUNWAY	4-22	13-31	4-22	13-31
AIRCRAFT WEIGHT	≤ 12,500 LBS.	12,500 - 60,000 LBS.	≤ 12,500 LBS.	60,000 LBS.
APPROACH SPEED	< 121 KNOTS	< 141 KT	< 121 KT.	< 141 KT.
WING SPAN	< 49 FT.	< 79 FT.	< 49 FT.	< 118 FT.
TAIL HEIGHT	17 FT.	21 FT.	17 FT.	32 FT.
AIRPORT REFERENCE CODE	B-I	C-II	B-I	C-III

(Legend for land inventory map)

AREAS	ACRES	TYPE OF INTEREST	ACQUISITION PROGRAM
A	405.24	FEE	UNKNOWN
B	65.62	FEE	FAAP 1952
C	120.75	FEE	ADAP 1972
D	205.03	FEE	AIP 1983
E	24.99	CLEAR ZONE EASEMENT	STATE AID 1961
F	18.17	AVIGATION EASEMENT	COUNTY 1957
TOTAL FEE OWNED			796.64
TOTAL CLEAR ZONE EASEMENT			24.99
TOTAL AVIGATION EASEMENT			18.17

10. True bearings of all runways and/or landing strips are shown to the nearest hundredth of a degree and noted as true. Magnetic declination should be shown at the north arrow.

11. Elevations to the nearest tenth of a foot, and stations are shown for all existing and proposed runway or landing strip ends and intersections (do not use negative stationing); high and low points of each paved runway; and displaced thresholds. For precision instrument runways grade changes within 3000′ of threshold should be indicated.

12. Location of ultimate airport reference point shown on plan by station and offset.

13. Existing and proposed buildings and building areas shown. Roof elevations for existing buildings shown on layout sheet or other sheets when necessary.

14. Displaced thresholds are displaced in accordance with **FAA AC 150/5300-13, Appendix 2** or as previously approved by FAA. Stations and elevations of any displaced thresholds are shown.

15. Airport drainage direction and structures shown where appropriate.

16. Ground contours shown if unusual conditions exist (only if clarity is not lost.)

17. Facilities that are to be phased out, if any, are described. Any conversion of runways to taxiways, etc., is noted.

18. All objects affecting visibility zone between landing strips and/or runways are shown and disposition described.

19. Building restriction line is shown on both sides of runways and extended to airport property line or approach surfaces. This should include line-of-sight criteria between runways at non-control tower airport.

20. Depict threshold lights with symbols. Show type of lighting (LIRL, MIRL, etc.) in Runway Data Table. **DO NOT** depict runway edge lights on drawing.

21. Show any clearway or stopway associated with a runway.

22. Dimension runway and taxiway widths and lengths, separations from runway centerline to building restriction line, holdline, taxiway/taxilane centerline, parallel runway centerline, property line, and aircraft parking, and separations from taxiway centerline to building restriction line, parallel taxiway/taxilane centerline, and aircraft parking areas.

APPROACH SURFACE DATA

APPROACH SURFACE DIMENSIONS

	RUNWAY	BASE	LENGTH	OUTER WIDTH	APPROACH SLOPE
EXISTING	4	1000′	3400′	2020′	34:1
	22	1000′	3400′	2020′	34:1
	13	250′	2000′	650′	20:1 ✳
	31	250′	2000′	650′	20:1 ✳
ULTIMATE	4	1000′	5000′	2500′	50:1
	22	1000′	5000′	2500′	50:1
	13	500′	2000′	1100′	20:1
	31	500′	2000′	1100′	20:1

RUNWAY SAFETY AREA (RSA)

EXISTING RUNWAY SAFETY AREA DIMENSIONS

RUNWAY	WIDTH	LENGTH BEYOND RUNWAY END
4-22	500′	1000′
13-31	120′✳	240′✳
ULTIMATE		
4-22	500′	1000′
13-31	150′	300′

RUNWAY OBJECT FREE AREA (OFA)

EXISTING RUNWAY OBJECT FREE AREA DIMENSIONS

RUNWAY	WIDTH	LENGTH BEYOND RUNWAY END
4-22	800'	300'
13-31	250'	240'
ULTIMATE		
4-22	800'	1000'
13-31	400'	300'

RUNWAY END COORDINATES (NAD 83)

EXISTING

RUNWAY	LAT.	LONG.
4	43°12'45.32"N	90°11'15.01"W
22	43°12'45.24"N	90°10'23.21"W
13	43°12'48.12"N	90°11'07.41"W
31	43°12'23.33"N	90°11'07.58"W

RUNWAY END COORDINATES (NAD 83)

ULTIMATE

RUNWAY	LAT.	LONG.
9	43°12'45.05"N	90°11'15.23"W
27	43°12'45.23"N	90°10'10.03"W
18	43°12'43.23"N	90°11'07.35"W
36	43°12'08.31"N	90°11'07.37"W

RUNWAY PROTECTION ZONE DATA (RPZ)

DIMENSIONS

	RUNWAY	INNER WIDTH	OUTER WIDTH	LENGTH
EXISTING	4	1000′	1510′	1700′
	22	1000′	1510′	1700′
	13	250′	450′	1000′
	31	250′	450′	1000′
ULTIMATE	4	1000′	1750′	2500′
	22	1000′	1750′	2500′
	13	500′	700′	1000′
	31	500′	700′	1000′

* NOT PRESENTLY PROVIDED.

PLEASE NOTE:

DATA FOR EXISTING CRITERIA TO BE SHOWN ON EXISTING SHEETS, AND FOR ULTIMATE CRITERIA TO BE SHOWN ON ULTIMATE SHEETS.

TABLE OF MODIFICATIONS TO FEDERAL STANDARDS

ITEM	MODIFICATION	DATE OF FAA ACTION W/AIRSPACE CASE #
RUNWAY 11/29 SAFETY AREA	SUBSTANDARD SIZE	WAIVER GRANTED 6-28-92 92 AGL-1510-NRA
TAXIWAY "A"	TOO CLOSE TO RUNWAY	WAIVER GRANTED 7-5-90 89 AGL-1535-NRA
HANGAR	BLOCKS LINE OF SIGHT	WAIVER REQUESTED 12-25-91 88 AGL-1654-NRA
TREE (OBSTRUCTION #18-3)	PENETRATES 7:1	DETER. OF NO HAZARD 12-25-91 AGL-1701-NRA
ROAD (OBSTRUCTION #9-4)	PENETRATES 20:1	DISPLACED THRESHOLD 9-10-85 AGL-1488-NRA
T.V. ANTENNA (OBST. #27-7)	PENETRATES 7:1	DETER. OF NO HAZ. REQ. AGL-1685-NRA

23. Areas reserved for future aviation development and services are outlined, e.g., general aviation, fixed base operations, heliports, cargo facilities.

24. The application of declared distances are shown in tabular form for each runway in both directions where those criteria are used.

C. **Terminal Area Drawing (Scale: 1″ = 50′ or 1″ = 100′)**

1. Fueling facilities, existing and ultimate, including underground storage shown.

2. Air carrier gate positions shown, indicated by circles, existing and ultimate positions designated.

3. Existing and ultimate security fencing with gates shown.

4. Existing and ultimate buildings shown with critical elevations of highest buildings and buildings closest to the runway. Identify T-hangars and/or corporate hangars.

5. Existing or ultimate rotating beacon with elevation.

6. Building Restriction Lines (BRL).

7. Taxiway or taxilane centerlines designated, existing and ultimate.

8. Aprons, taxiways, clearances, etc. dimensioned.

9. Existing or ultimate lighted wind cone (with top elevation), wind tee, and segmented circle.

10. Location, ties, and elevations of any bench marks or monuments in terminal area.

11. Auto parking existing and ultimate shown.

12. Ground contours shown, if appropriate.

13. Drainage including any structures.

14. Control Tower with top elevation.

15. Entrance and access roads, existing and ultimate shown.

16. Various aircraft aprons, existing and ultimate, and their function shown (air carrier, cargo, transient, tie down area with tie downs shown, etc.)

17. Legend where necessary.

18. Index of buildings and facilities where necessary.

19. Line of sight, existing and ultimate.

20. Show aircraft parking limit line where appropriate.

D. **Approach Surface Drawings (Approach Sheets)**

Plan and profile view of existing or ultimate approach areas are required for all existing and ultimate runways in all airport layout plan packages.

1. Plan View

   a) Sufficient detail of runway to orient plan. Runway number indicated on the runway, and runway end elevations and stations, existing or ultimate, should be shown. Runway elevations and stations of any displaced or relocated threshold, existing or ultimate, should be shown.

   b) Scale will depend on the size of the approach surface. Usually a scale of 1″ = 100′ or 1″ = 200′ will be best. Prominent north arrow displayed. Generally a separate sheet for each approach will be needed. Where a large runway extension is proposed, it may be necessary to have two sheets for the approach. For Utility runways with visual approaches, both approach areas may fit on one sheet. Where obstructions occur along the entire length of a runway, it may be necessary to have additional sheets showing those objects and their disposition.

   c) All man-made and natural objects laterally from the runway centerline should be shown to a distance where **100′** above the adjacent runway elevation is obtained in the 7:1 transition surface, or to a distance to reasonably show all obstructions to Part 77, Appendix 2, or TERPS Departure Surface. This applies in the approach and for the entire runway length and includes trees, poles, antennas, hangars, buildings, rotating beacon, etc. Separate sheets may be necessary to show these items and their disposition. It may be necessary to show some object elevations on the layout plan sheet or terminal area sheet. Show tree removal limits necessary to provide clear surfaces.

   d) All man-made and natural objects must be shown in the approach area. Minimum coverage extends to the distance where the approach surface and transition surface clear **the runway end elevation by 100′**; it may be necessary to extend the coverage further because all objects which penetrate any existing or ultimate Part 77, Appendix 2, or TERPS Departure imaginary surfaces (i.e., primary, transition, or approach) or any object 5′ below these surfaces must be shown on the plan and profile sheets.

   e) All roads, railroads, and waterways shown. The critical elevation of these items, and approach clearance over the roads, railroads, or waterways must be shown where the extended runway centerline and sides of the existing or ultimate approach surfaces intersect the road, railroad or

waterway. The clearance is the **actual** difference between the approach surface and the traverse way elevation.

f) Existing or ultimate approach surfaces, threshold location planes, TERPS Departure Surfaces, (with controlling obstruction or object labeled), runway safety areas, and runway object free areas should be shown, labeled, and dimensioned. On runways where these required criteria are not provided, a note should indicate same.

g) The following should be shown only when declared distances are used: existing or ultimate clear ways, stopways and runway protection zones (RPZ). TORA, TODA, ASDA and LDA indicated for each runway end in each direction.

h) Controlling objects and/or obstructions indicated. Each obstruction in the plan view should be numbered to coincide with the "Schedule of Obstructions" and be shown in the profile view. Elevations shown in the plan view to the extent possible without cluttering the drawing. Elevations can be shown in the schedule of obstructions, as an alternative. If there are no obstructions, state "There are no obstructions to this approach." Include the date of survey.

i) Existing or ultimate property lines. Section corners indicated.

j) Ground contours where available and when significant; an interval of **2' is optimum**; however, in some cases, 5' intervals will suffice.

k) Navigational Aids and miscellaneous lighting aids (existing and ultimate) should be shown (Threshold lights, VASIs, REIL, MALS, etc.) Approach lighting systems should be shown in the plan and profile views. Elevation of each lighting unit in the profile view should be as existing or proposed.

2. **Profile View**

a) Profile view directly below plan view – stationing coincides vertically. Stationing agrees with the airport layout sheet.

b) Preferred vertical scale – 1" = 10' or 1" = 20'.

c) Existing runway centerline ground profile shown to limits of the plan view. If there is considerable difference between the centerline profile and the approach slope, a reduction in vertical scale may be appropriate. Runway end and displaced or relocated threshold stations and elevations should be shown in the plan and profile view.

d) All roads and railroads should be shown and identified.

e) Existing or ultimate approach and transition surfaces and **all** objects penetrating or within 5′ below these imaginary surfaces shall be shown. If the threshold has been displaced in accordance with FAA AC 150/5300-13, Appendix 2, or previous FAA Orders or Advisory Circulars, the "threshold location plane" is shown.

f) The date of FAA approval should be shown by note on the plan. Also show the controlling obstruction which determines the displaced threshold and its elevation.

g) Objects which penetrate the 7:1 transition slope or come within five feet of it should be shown. The point where the existing and ultimate 7:1 surface, if different, passes through the object should be shown with symbol and defined in legend.

h) Object heights need not be measured to closer than the nearest 0.5′.

i) Depict as closely as possible the object being shown, e.g., show a house shape for a house, a tree shape for a tree.

j) The highest point of a structure is shown. If only the antenna or chimney is an obstruction and not the structure, the elevation of the structure should still be shown on the plan view.

k) The controlling object or obstruction with elevation shown and the actual "clear for" approach slope from the end of the primary surface indicated.

l) If there are so many objects to be shown that the profile view would become cluttered and unreadable, then only vertical lines are shown to the correct height with their identifying number. Groups of trees should be shown by a line between tree symbols placed at the extremities of the trees.

m) Legend included to identify lines and symbols.

n) Each obstruction numbered in the profile view and in the plan view to coincide with the Schedule of Obstructions.

o) Title block includes airport name, runway approach number, plan and profile scales, date, sheet number and consultant.

3. **Schedule of Obstructions**

a) Every obstruction or group of obstructions (trees) to every imaginary surface as defined in Part 77, Appendix 2, or TERPS Departure criteria must be listed. This includes the entire primary, transition, and approach surfaces. Those items shown on the plan and profile that are not obstructions, i.e. not within

5′ of an imaginary surface, should not be listed in the schedule.

b) Every obstruction must be shown on at least one sheet of the ALP. Objects along the entire length of the runway must be considered.

c) A proposed disposition must be shown for every obstruction. If an FAA aeronautical study is requested for a determination of no hazard or if the FAA has made a determination of no hazard this should be noted. (See "Schedule of Obstructions", page 19.)

E. **Land Inventory Map**

1. Scale 1″ = 200′ to 1″ = 600′.
2. The exterior boundary of all existing airport property interests must be shown. Division boundaries should be shown for land purchased under FAAP, ADAP, AIP, state aid project, airport owner only, and any other acquisition program.
3. Bearings and distances should be shown (when available) for the exterior airport boundary and each easement interest. Bearings shown and noted as true.
4. Show Existing and Ultimate Runway Protection Zones w/dimensions.
5. Show the station of the intersection of runway centerline extended with the property boundary line.
6. Show all permanent runway or airport reference monuments with distances and elevations.
7. Section corners, section lines, township and range, and/or government lot lines.
8. Property Table: (See legend for Land Inventory Map, page 9.)

   Acreage for each division identified in 2 above.

   Type of interest owned by airport (Fee, Avigation Easement, Clear Zone Easement.)

   Identify the program and year land was acquired under, (e.g., FAAP, ADAP, AIP, State Aid Project, Sponsor Only.)

   Total acreage in fee and easements.
9. Title block, legend, date, consultant, and revision block.
10. Show public road and railroad rights of way.

F. **Land Use Drawing**

This drawing provides airport management with a plan for leasing revenue producing areas on the airport. It also provides guidance for determining allowable proximity of farming operations to runways and taxiways. See pg. 22 for Policy on crops.

The drawing should be sufficiently detailed to allow the airport management to determine which areas must be kept in mowed grass and which areas are restricted to low growing crops. The obstacle free zone, the runway object free areas, must be kept mowed and free of crops. Low crops are allowed outside these areas. High crops are allowed outside the primary surface, the runway object free areas, and the runway visibility zones.

Within the various parcels on and off the airport, standard drafting symbols (shading, cross hatching, etc.) should be used to identify recommended land use by general category (agricultural, industrial, recreational, etc.)

Identify the date and type of any zoning ordinance in effect. Depict boundaries of local government.

Depict the location of all public facilities (schools, hospitals, parks, etc.) in the vicinity of the airport.

G. **Airport Airspace Drawing - FAR Part 77 Surfaces**

1. This drawing is only necessary as part of a master plan study or update.

2. Plan View - Scale: 1″ = 2000′

   a) Show ultimate runway length with end numbers using current USGS 7 ½ minute quadrangle map as a base map.

   b) Identify objects, and note their top elevations, which penetrate **any** of the surfaces, except those which are in inner approach surfaces. For the latter, add note, "See approach profiles for close in obstructions."

   c) Show all FAR Part 77.25 surfaces, including the horizontal surface with elevation and conical surfaces above it.

3. Profile View - Scale: 1″ = 1000′

   a) Detail ground profile along the runway centerline extended, and all significant objects with the approach surfaces regardless of whether they are obstructions.

   b) Show existing and ultimate runway ends and FAR Part 77.25 approach slopes.

PLAN AND PROFILE OF APPROACHES
EXAMPLE SCHEDULE OF OBSTRUCTIONS
RUNWAY 20

Date Surveyed

SCHEDULE OF OBSTRUCTIONS
PENETRATION IN FEET

Key Future No.	Description (with elevation)	Existing (or Ultimate)					Disposition
		Primary Surface	34:1	7:1	Appendix 2 Surface	TERPS Departure Surface	
20-1	Building (945.0)			14’			*
20-2	Power Pole(981.1)						*
20-3	Trees (991.2)			0-11’			Remove
20-5	Power Pole						*
20-6	Trees						Remove
20-7	Power Pole			6’			*
20-8	Power Pole			16’			*
20-9	Power Pole						*
20-10	Trees						Remove
20-11	Buildings						*
20-12	Trees			11’			Remove
20-13	Power Pole						Remove
20-15	Trees			0-22’			Remove
20-16	Trees			0-16’			Remove
20-17	Power Pole					27’	Remove
20-18	Tree				9’		Remove
20-19	CTH”TJ”		2’		0-4’		(1)
20-20	Trees			13’			Remove
20-21	Ground				0-31’	0-29’	Remove
20-22	Silo			8’			(2)

*FAA Determination of No Hazard Requested

(1) This road is marked and lighted and runway 20 threshold is displaced. See FAA ALP approval letter dated October 23, 1976.

(2) The Silo is determined not to be a hazard. See FAA letter dated February 5, 1980.

May 1, 2002

Ms. Nancy Nistler
FAA Airports District Office
6020 28th Avenue South, Room 102
Minneapolis, MN 55450

Eagle River Union Airport
Airport Layout Plan
Airspace Case #2002-AGL-347-NRA

Dear Nancy:

Enclosed for your review and approval is an Airport Layout Plan (ALP) for the Eagle River Union Airport. The ALP was developed in accordance with AC 150/5300-13,and changes. This ALP replaces the previously approved ALP dated November 21, 1995. The ALP changes consist of showing updates for the existing conditions and a revised length on the secondary Runway 13/31. The following is a page by page discussion of the changes to the ALP:

Sheet 1 – Title sheet: The pavement configuration has been revised to show current conditions. The Airport Data box has been revised for existing and ultimate navigational and visual aids. The Design Critical Aircraft for Runway 4/22 is shown as B-II, Runway 13/31 is shown as B-I.

Sheet 2 – Airport Layout Drawing: Runway 4/22 is shown as the primary runway with an ultimate length of 6,000. The runway will have NPI approaches with 34:1 approach slopes and a full length parallel taxiway on the west side to serve the hangar area. Adams Road will ultimately be closed to provide the necessary clearance. Runway 13/31 is the crosswind runway and is shown as paved and reduced in length from 3,850' on the previously approved ALP to 3,400'.

Sheet 3 – Terminal Area Drawing: This drawing has been updated to show new hangars and the deer fence.

Sheet 4 – Terminal Area Drawing: This is a new drawing showing hangars on the west side of Runway 4/22.

Sheet 5 – Runway 4 Approach Drawing: A 1,004' extension to the southwest is shown for an ultimate runway length of 6,000. Lost River Road will be relocated outside the ultimate OFA and RSA. The ultimate property line is shown. Approximately 36 acres would need to be acquired.

The trees (4.1) are obstructions to the existing and ultimate 7:1. These trees provide a visual and nose buffer to the homes located along Lost River Road. For that reason, a "Determination of No Hazard" is requested.

Sheet 6 – Runway 22 Approach Drawing: The existing 20:1 approach is shown with Adams Road closed to provide the appropriate clearance. The 1995 ALP used a threshold location plane to provide the clearance, but Appendix 2 criteria for night operations won't allow it. The City decided to close the road rather than displace the threshold. The ultimate approach surface is

shown as 34:1. The trees (22.9) are obstructions to the ultimate 7:1 are located in the front yards of adjacent homes. A "Determination of No Hazard" is requested.

Sheet 7 – Runway 13 Approach Drawing: The existing turf crosswind runway is shown to be replaced with a 75' x 3,400' paved runway for visual use only. The length on the west end was reduced because of environmental concerns in the proximity of the river. 31 acres of fee or easement property will need to be acquired.

Sheet 8 – Runway 31 Approach Drawing: The existing turf crosswind runway is shown to be replaced with a 75' x 3,400' paved runway for visual use only. The length on the east end was reduced to provide clearance over Adams Road, since the City will not be closing the road.

Sheet 9 – Land Inventory Map: No changes.

Design Standard Waivers

The ALP was completed utilizing the standards in AC 150/5300-13,and changes. No waivers are requested.

Summary of No Hazard Determinations Requests

1. Sheet 5: The trees (4.1) are obstructions to the existing and ultimate 7:1. These trees proved a visual and noise buffer to the homes located along Lost River Road. A "Determination of No Hazard" is requested.

2. Sheet 6: The trees (22.9) are obstructions to the ultimate 7:1. These trees are located in the front yard of adjacent homes. A "Determination of No Hazard" is requested.

We believe public circularization is not necessary, since this is an updated ALP. Please conduct an aeronautical study of this plan and respond with your comments and those received from any other FAA branch shown copied below. If you have any questions, please contact me at (608) 266-3220, or at james.jensen@dot.state.wi.us.

Sincerely,

James A. Jensen, P.E., Chief
Airport Engineering Section

Enclosure

cc: Manager, Aviation Systems Standards Service, AVN-140B
Manager, Resource and Planning Branch, AGL-470
Manager, System Management Branch, AGL-520

Aircraft approach category and design group [1]	Distance in feet from runway centerline to crop		Distance in feet from runway end to crop		Distance in feet from centerline of taxiway to crop	Distance in feet from edge of apron to crop
	Visual & ≥ 3/4 miles	< 3/4 mile	Visual & ≥ 3/4 miles	< 3/4 mile		
Category A & B Aircraft						
Group I	200 [2]	400	400 [3]	600	45	40
Group II	250	400	400 [3]	600	66	58
Group III	400	400	600	800	93	81
Group IV	400	400	1,000	1,000	130	113
Category C, D & E Aircraft						
Group I	530 [3]	575 [3]	1,000	1,000	45	40
Group II	530 [3]	575 [3]	1,000	1,000	66	58
Group III	530 [3]	575 [3]	1,000	1,000	93	81
Group IV	530 [3]	575 [3]	1,000	1,000	130	113
Group V	530 [3]	575 [3]	1,000	1,000	160	138
Group VI	530 [3]	575 [3]	1,000	1,000	193	167

[1] Design groups are based on wing span and category depends on approach speed of the aircraft.

Group I - wing span up to 49 feet
Group II - wing span 49 feet up to 78 feet
Group III - wing span 79 feet up to 117 feet
Group IV - wing span 118 feet up to 170 feet
Group V - wing span 171 feet up to 213 feet
Group VI - wing span 214 feet up to 261 feet

Category A - approach speed less than 91 knots
Category B - approach speed 91 knots up to 120 knots
Category C - approach speed 121 knots up to 140 knots
Category D - approach speed 141 knots up to 165 knots
Category E - approach speed 166 knots or more

[2] If the runway will only serve small airplanes (12,500 lb. And under) in Design Group I, this dimension may be reduced to 125 feet. However, this dimension should be increased where necessary to accommodate visual navigational aids that may be installed. For example, farming operations should not be allowed within 25 feet of a Precision Approach Path Indicator (PAPI) light box.

[3] These dimensions reflect the Threshold Siting Surface (TSS) as defined in AC 150/5300-13, Appendix 2. The TSS cannot be penetrated by any object. Under these conditions, the TSS is more restrictive than the OFA and the dimensions shown here are to prevent penetration of the TSS by crops and farm machinery.